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=> d his

     (FILE 'HOME' ENTERED AT 14:25:34 ON 05 FEB 2003)

     FILE 'CA' ENTERED AT 14:25:43 ON 05 FEB 2003
L1         47364 S HYDROXYAPATITE OR APATITE OR (CALCIUM PHOSPHATE) OR (TRICALCI
L2        346579 S FOAM? OR SCINTER? OR POROUS? OR POROSITY
L3          2381 S L1 AND L2
L4         34509 S IMPLANT
L5           806 S L4 AND L3

=> log hold
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                   605.71     605.92

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)          SINCE FILE      TOTAL
                                                       ENTRY    SESSION
CA SUBSCRIBER PRICE                                   -96.10     -96.10

 SESSION WILL BE HELD FOR 60 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 16:18:47 ON 05 FEB 2003
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L8 ANSWER 32 OF 35 CA COPYRIGHT 2003 ACS
AN 109:156303 CA
TI Manufacture of calcium phosphate porous materials as bone substitutes and adsorbents in biochemical separation
IN Hakamazuka, Koji; Irie, Hiroyuki
PA Olympus Optical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 63040782	A2	19880222	JP 1986-183590	19860805
PRAI	JP 1986-183590		19860805		

AB Porous Ca phosphate materials are manufd. by mixing cryst. **hydroxylapatite** or .beta.-Ca3(PO4)2 powder with a binder and a **foam**-producing agent, making this porous mixt. into a shape, drying, heating, eliminating the **foam**-producing agent and binder and finally **sintering** at a high temp. Ammonium acrylate polymer (10 mL) as a binder was added to 10 g of .beta.-Ca3(PO4)2 powder (.ltoreq.0.3 .mu.m) and mixed under the influence of ultrasound waves, and then 2 g of polyoxyethylene nonylphenol-ethylene oxide mixt. was added. This porous fluid was poured into a mold, dried at 40.degree. for 15 h, transferred to an alumina container and **sintered** at 1000.degree. for 40 min.

use resin to stabilize green material

Foamed, Sintered

L8 ANSWER 30 OF 35 CA COPYRIGHT 2003 ACS
AN 113:120851 CA
TI Preparation of porous ceramics as artificial bone and dental materials
IN Tamura, Naoharu
PA Asahi Optical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01314572	A2	19891219	JP 1988-147195	19880615
PRAI	JP 1988-147195		19880615		

AB The porous ceramics are prepd. by mixing ceramics powders (calcium phosphate compds. e.g. **hydroxyapatite**) with the blowing agents (e.g. H2O2 or egg white) and fibers (e.g. paper products) and **sintered** at 900-1400.degree. after heated at 700.degree. to remove the fibers. Thus, **hydroxyapatite** 100 g, fiber (paper) 6 g, and 30% H2O2 0.9 g were mixed in H2O 176.9 g, heated at 700.degree. to remove fiber, and **sintered** at 1200.degree. to form the porous ceramics, with 55% porosity.

foaming
(blowing agents)

8 ANSWER 14 OF 35 CA COPYRIGHT 2003 ACS
AN 133:211771 CA
TI **Sintering** and creation of porous structure of bioactive ceramics
AU Fidancevska, Emilija; Bossert, Jorg; Milosevski, Milosav
CS Faculty of Technology and Metallurgy, University "St Ciril and Methodius", Skopje, 91000, Yugoslavia
SO Advanced Science and Technology of Sintering, [Proceedings of the World Round Table Conference on Sintering], 9th, Belgrade, Yugoslavia, Sept. 1-4, 1998 (1999), Meeting Date 1998, 237-243. Editor(s): Stojanovic, Biljana D.; Skorokhod, Valery Vladimirovich; Nikolic, Maria Vesna. Publisher: Kluwer Academic/Plenum Publishers, New York, N. Y. CODEN: 69ACSR
DT Conference
LA English
AB **Hydroxyapatite** ceramics were prepd. with 2 types of structures, dense compacts and porous sponge. Porous materials were prepd. by 3 methods. 1) Polyethylene **foam** sponge was impregnated by **hydroxyapatite** suspension, then pyrolyzing to remove the sponge and **sintering** the ceramic, leaving the **foam**-like structure. 2) C fibers were added to a **hydroxyapatite** suspension, followed by drying and **sintering** to pyrolyze the carbon fibers. 3) H2O2 was added to a **hydroxyapatite** suspension as a pore former, followed by casting in Al frame, drying and **sintering**. The structure and mech. properties as a function of porosity were examd. **Hydroxyapatite** porous ceramics prepd. using H2O2 as a pore former had the best combination of mech. properties and porosity for use as cortical and cancellous bone.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 389 OF 806 CA COPYRIGHT 2003 ACS
AN 129:127105 CA
TI Electrophoretic coatings of **porous apatite** composite onto alumina ceramics
AU Yamashita, Kimihiro; Yonehara, Eiko; Hamagami, Jun-Ichi; Umegaki, Takao
CS Department of Industrial Chemistry, Tokyo Metropolitan University, Tokyo, 192-03, Japan
SO Bioceramics, Proceedings of the International Symposium on Ceramics in Medicine (1997), 10, 463-466
CODEN: BPCMFX
PB Elsevier Science Ltd.
DT Journal
LA English
AB The coating of **porous hydroxyapatite** on alumina and zirconia ceramics was undertaken by the electrophoretic lamination method. The multilayers were comprised of **porous hydroxyapatite** , intermediate **hydroxyapatite**, and adhesive layer of **calcium phosphate** glass. The open **porosity** and pore size of the surface layers were adjusted by the addn. of graphite or alumina powders. In the case of alumina additives, the surface layers were decompd. to **tricalcium phosphate** during sintering, while **hydroxyapatite** structure was maintained in graphite-added surfaces.

L5 ANSWER 358 OF 806 CA COPYRIGHT 2003 ACS
AN 130:43681 CA
TI Preparation of **porous hydroxyapatite** thin film on titanium metal substrate by sol-gel process
AU Umeda, Tomohiro; Nishio, Keishi; Watanabe, Yuichi; Tsuchiya, Toshio
CS Department of Materials Science and Technology, Faculty of Industrial Science and Technology, Science University of Tokyo, Chiba, 278, Japan
SO Phosphorus Research Bulletin (1998), 8, 31-36
CODEN: PREBE7; ISSN: 0918-4783
PB Japanese Association of Inorganic Phosphorus Chemistry
DT Journal
LA English
AB **Hydroxyapatite** (HAp: Ca10(PO4)6(OH)2) thin films having **porous** structure were prepd. by sol-gel process with dip-coating using calcium acetate (Ca(CH3COO)2.cntdot.H2O) and tri-Et phosphate. In the present study, the surface of titanium metal was coated with a sodium-titanium oxide layer by sol-gel process treatment with alkali hydroxide solns. HAp thin film prepd. on modified titanium substrate was then obtained at 800.degree.C (under transformation point of titanium metal) so at lower temp. than previous process. Peeling of HAp thin film was prevented by the formation of sodium-titanium oxide layer. Calcium oxide free HAp films were synthesized with acetate as a raw material of calcium and rapid heating at 800.degree.C for 1 h. The films were chem. bonded to the substrate and had a **porous** structure which was expected to show a good bioactivity.
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

NSWER 2 OF 4 CAPLUS COPYRIGHT 2003 ACS
AN 2001:850734 CAPLUS
DN 135:376834
TI Biomaterial comprising **calcium phosphate** **sintered** body
IN Ochi, Takahiro
PA Mmt Co., Ltd, Japan; Toshiba Ceramics Co., Ltd.
SO Eur. Pat. Appl., 47 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

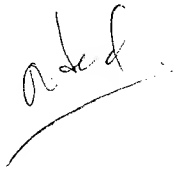
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1155705	A2	20011121	EP 2001-112106	20010517
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002017846	A2	20020122	JP 2000-294841	20000927
	JP 2002102328	A2	20020409	JP 2000-294842	20000927
	JP 2002102329	A2	20020409	JP 2000-294843	20000927
PRAI	JP 2000-148561	A	20000519		
	JP 2000-294841	A	20000927		
	JP 2000-294842	A	20000927		
	JP 2000-294843	A	20000927		

AB A **porous** body is a calcium phosphates **sintered** body having a no. of substantially globular **pores**. A **porosity** is not less than 55% and not more than 85%, and simultaneously, and a mean **pore** diam. is not less than 50 .mu.m and not more than 800 .mu.m. A **pore** having a size larger than the mean **pore** diam. has at least three communicating **pores** having a diam. of not less than 5 .mu.m, on the av., and simultaneously, a **pore** having at least the three communicating **pores** has at least one communicating **pore** having a diam. of not less than 25 .mu.m, on the av. The total opening area of the communicating **pore** which is possessed by the **pore** having a size larger than the mean **pore** diam. occupies the ratio of not more than 50% of the **pore** surface area. In a dry state, it is possible to wet the whole the **porous** body by dropping water and **blood**.

L3 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2003 ACS
AN 1997:268598 CAPLUS

4

L5 ANSWER 260 OF 806 CA COPYRIGHT 2003 ACS
AN 132:339198 CA
TI Treatment of osteomyelitis by using antibiotic-loaded **porous** ceramic
AU Itokazu, M.; Itoh, Y.; Fukuta, M.; Miyamoto, K.; Ohara, A.; Oshima, K.; Nishimoto, Y.; Ohno, T.; Kasai, T.; Shimizu, K.
CS Department of Orthopaedic Surgery, Gifu University School of Medicine, Gifu, 500-8705, Japan
SO Bioceramics, Proceedings of the International Symposium on Ceramics in Medicine (1999), 12, 3-6
CODEN: BPCMFX
PB World Scientific Publishing Co. Pte. Ltd.
DT Journal
LA English
AB **Porous hydroxyapatite** block (HAB) could be used as a sustainer of antibiotics or anticancer drugs because of its interlinked pore structure. HAB was mixed with an antibiotic soln. and decompressed in vacuum container under from 5 to 10 in. (127-254 mm) Hg/20 min. to load antibiotics into HAB-pores. Twenty-one patients with osteomyelitis including one with tuberculosis and 5 patients with infected joint replacement had been treated in combination with an i.v. injection. On follow up study (from 8 to 85 mo; averaged 41.5 mo), all of the foci had completely healed primarily by the end of the follow-up period except a case which was used on the open tibial fracture with a plate fixation. These new methods are simple, can be performed safely to treat osteomyelitis as a 1-stage operation.
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD



L8 ANSWER 13 OF 35 CA COPYRIGHT 2003 ACS
AN 133:355273 CA
TI Calcium phosphate-based porous **sintered** body and its production method.
IN Imura, Koichi; Uemoto, Hideo; Hojo, Akimichi; Tanaka, Junzo; Kikuchi, Masanori; Suetsugu, Yasushi; Yamazaki, Hiroshi; Kinoshita, Masami; Minowa, Nobuaki
PA Toshiba Ceramics Co., Ltd., Japan; Science and Technology Agency National Institute for Research In Inorganic M; Toshiba Denko Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000302567	A2	20001031	JP 1999-105579	19990413
	GB 2348872	A1	20001018	GB 2000-9085	20000412
	DE 10018394	A1	20001207	DE 2000-10018394	20000413
	US 6340648	B1	20020122	US 2000-548742	20000413
PRAI	JP 1999-105579	A	19990413		

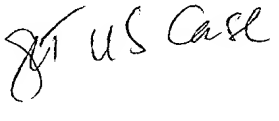
AB The invention provides a calcium phosphate-based porous **sintered** body having sufficient mech. strength and biocompatibility, suitable for use as a bone prosthetic material, etc., wherein the **sintered** body has a porosity of 55-90 %, and continuous spherical pores with pore diams. of .gtoreq. 150 .mu.m and an av. diam. of the continuum portion of .gtoreq. 50 .mu.m, and wherein the three-point bending strength of the **sintered** body is .gtoreq. 5 MPa. A porous **sintered** body was prepd. from **hydroxyapatite** powder, water solvent, polyethyleneimine binder, polyoxyethylene lauryl ether **foaming** agent, and sorbitol polyglycidyl ether crosslinking agent.

L8 ANSWER 8 OF 35 CA COPYRIGHT 2003 ACS
AN 134:371850 CA
TI Process for producing rigid reticulated articles
IN Marx, Jeffrey G.; Heckendorf, Bradley R.; Johnson, James R.; Venarsky, John Jeffrey
PA Phillips-Origen Ceramic Technology, LLC, USA
SO PCT Int. Appl., 36 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001036013	A1	20010525	WO 2000-US20734	20000731
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	EP 1231951	A1	20020821	EP 2000-955280	20000731
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
PRAI	US 1999-440144	A	19991115		
	WO 2000-US20734	W	20000731		

AB A process for producing a rigid reticulated article includes: (a) providing a first dispersion of a ceramic or metal powder, a binder, and a solvent; (b) providing a reticulated substrate which has open, interconnected porosity; (c) contacting the reticulated substrate with the first dispersion to coat the substrate with the dispersion to form a first coating; (d) drying the coated reticulated substrate; (e) contacting the reticulated substrate with 1 or more addnl. dispersions to form addnl. coatings wherein the compn. of the addnl. coatings are the same or different from each other and the first coating; (f) drying the addnl. coating between the steps of contacting; (g) heating the coated reticulated substrate at a time and temp. sufficient to pyrolyze any org. components; and (h) **sintering** to form a ceramic or metal or composite reticulated article. In another aspect, the binder becomes solvent-insol. and flexible upon drying. According to this aspect, one or more addnl. coatings may optionally be used. Thus, a stainless steel reticulated **foam** was prepd. from stainless steel-316 715, D-3021 dispersant 7.5, B-1000 binder 100.5, Surfynol-420 2.5, and Nopco NXZ 10 g, and water 105 mL.

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT



L5 ANSWER 248 OF 806 CA COPYRIGHT 2003 ACS
AN 132:352717 CA
TI **Porous hydroxyapatite** prepared by gel casting of **foams** for biomedical applications
AU Sepulveda, P.; Pandolfelli, V. C.; Rogero, S. O.; Higa, O. Z.; Bressiani, J. C.
CS Departamento de Engenharia de Materiais Universidade Federal de S. Carlos, S. Carlos, 13565-905, Brazil
SO Ceramica (Sao Paulo) (1999), 45(296), 198-202
CODEN: CMCAAG; ISSN: 0366-6913
PB Associacao Brasileira de Ceramica
DT Journal
LA English
AB A novel technique has been applied to manuf. **porous hydroxyapatite** for **implant** applications. The process involved generation of **foam** from an aq. suspension of the powder followed by in situ polymn. of org. monomers, which had been previously added to the compns. This method produces strong gelled and complex-shaped bodies with up to 90% **porosity** that can withstand machining in the green state. The org. additives are eliminated at temps. above 300.degree.C and sintering is carried out for consolidation of the ceramic matrix. An optimized mech. strength results from a highly densified matrix combined with spherical interconnected cells of diam. ranging from 20 to 1000 .mu.m and channels of 10-100 .mu.m, depending on the specimen d. Cytotoxicity test was conducted with sintered HA exts. in contact with mammalian cells, based on a quant. method of colonies formation suppression. The in vitro test revealed that the original purity of the biomedical-grade **hydroxyapatite** powder was neither affected through processing nor by the employed reagents.
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 336 OF 806 CA COPYRIGHT 2003 ACS
AN 130:357096 CA
TI Role of interconnections in **porous** bioceramics on bone recolonization in vitro and in vivo
AU Lu, J. X.; Flautre, B.; Anselme, K.; Hardouin, P.; Gallur, A.; Descamps, M.; Thierry, B.
CS Institut de Recherche sur les Maladies du Squelette (IRMS), Berck-Sur-Mer, 62608, Fr.
SO Journal of Materials Science: Materials in Medicine (1999), 10(2), 111-120
CODEN: JSMMEL; ISSN: 0957-4530
PB Kluwer Academic Publishers
DT Journal
LA English
AB The interconnections in a **porous** biomaterial are the pathways between the pores. They conduct cells and vessels between pores. Thus they favor bone ingrowth inside ceramics. The aim of our study was to det. the effect on bone ingrowth of interconnections in 2 ceramics: **hydroxyapatite** (HA) and .beta.-**tricalcium phosphate** (.beta.-TCP) with the same **porosity** of about 50% and a mean pores size of 100-300 .mu.m and a mean interconnection size of 30-100 .mu.m. In vitro, 4 disks for osteoblast culture were studied after 14 and 28 days of incubation. Human osteoblasts can penetrate interconnections over 20 .mu.m in size, and colonize and proliferate inside macropores, but the most favorable size is over 40 .mu.m. In vivo, 8 cylinders were implanted in the middle shaft of both rabbit femurs for 12 or 24 wk. The histomorphometric results show that interconnections in **porous** ceramics favor bone ingrowth inside the macropores. In the HA group the rate of calcification and bone ingrowth do not differ, and chondroid tissue is obsd. inside pores. But in .beta.-TCP, the calcification rate and the bone ingrowth increased significantly. At week 12 significant correlation between new bone ingrowth and the size of the interconnections is obsd. between new bone ingrowth and the d. of pores. In conclusion we notice that in vivo a 20 .mu.m interconnection size only allows cell penetration and chondroid tissue formation; however the size of the interconnections must be over 50 .mu.m to favor new bone ingrowth inside the pores. We propose the concept of "interconnection d." which expresses the quantity of links between pores of **porous** materials. It assures cell proliferation and differentiation with blood circulation and extracellular liq. exchange. In resorbable materials, pore d. and interconnection d. are more important than their size, contrary to unresorbable materials in which the sizes and the densities are equally important.
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 379 OF 806 CA COPYRIGHT 2003 ACS
AN 129:180186 CA
TI Method for preparing bone substitutes with controlled **porosity**
IN Richart, Olivier; Szarzynski, Stephan
PA S.H. Industries, Fr.
SO PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DT Patent
LA French
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9834654	A1	19980813	WO 1998-FR213	19980205
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	FR 2758988	A1	19980807	FR 1997-1309	19970205
	FR 2758988	B1	20000121		
	AU 9862983	A1	19980826	AU 1998-62983	19980205
	EP 964707	A1	19991222	EP 1998-906978	19980205
	EP 964707	B1	20011004		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2001510375	T2	20010731	JP 1998-533875	19980205
	AT 206313	E	20011015	AT 1998-906978	19980205
	ES 2161517	T3	20011201	ES 1998-906978	19980205
	US 6316093	B1	20011113	US 1999-367017	19991112
PRAI	FR 1997-1309	A	19970205		
	WO 1998-FR213	W	19980205		

AB The invention concerns a method for prepg. macro-**porous** synthetic ceramics designed in particular for bone substitution. The invention also concerns macroporous synthetic ceramics comprising pores of controlled dimensions, distributed in no. and in surface in a predetd. manner, the interconnection between the pores being controlled.

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

ANSWER 219 OF 806 CA COPYRIGHT 2003 ACS

AN 133:256715 CA

TI Effect of various properties of **hydroxyapatite** ceramics on osteoconduction and stability

AU Kurioka, Kazuhito; Umeda, Masahiro; Teranobu, Osamu; Komori, Takahide

CS Department of Oral and Maxillofacial Surgery, Kobe University School of Medicine, Japan

SO Kobe Journal of Medical Sciences (1999), 45(3-4), 149-163
CODEN: KJMDA6; ISSN: 0023-2513

PB Kobe University School of Medicine

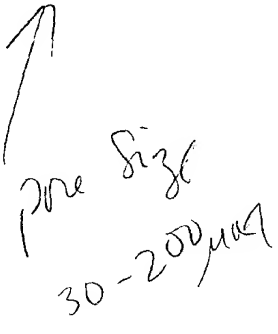
DT Journal

LA English

AB **Hydroxyapatite** ceramics (HA) are widely used for clin. applications as a bone substitute or dental **implant** because they have been shown to be biocompatible and exhibit excellent osteocond. when grafted into the bone tissue. However, the influence of the phys. properties of HA on the osteoconduction and stability remains unclear. We examd. here the effect of various properties of HA granules on osteoconduction and stability using 6 types of HA granules. The HA granules were grafted into the rabbit tibia and the initial bone formation and long-term stability of the new bone were studied histol. The following results were obtained;. (1) Osteoconduction of the HA granule was influenced by the shape. Multi-nuclear granules with continuous pores ranging from 30 to 200 .mu.m in diam. showed both excellent osteoconduction and stability. (2) Soly. behavior of HA granules, which was effected by the relative surface area sizes, also seemed to be an important factor for osteoconduction and stability. (3) Stable bi-phase ceramics with HA and .beta.TCP were produced at the sintering temp. of 1200.degree. when Mg was added. The .beta.TCP and Mg content did not neg. influence the initial osteoconduction or long-term stability.

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L



L5 ANSWER 272 OF 806 CA COPYRIGHT 2003 ACS
AN 132:199005 CA
TI Study on composite artificial bone of bone morphogenetic protein/**porous** .beta.-**tricalcium phosphate**
AU Wang, Shi-bin; Weng, Lian-jing; Zheng, Chang-qiong; Ran, Jun-quo; Wang, Fan-hu; Liang, Ghe; Hu, Yun-yu
CS School of Chem. Eng., Huaqiao University, Quanzhou, 362011, Peop. Rep. China
SO Sichuan Lianhe Daxue Xuebao, Gongcheng Kexueban (1999), 3(5), 76-82
CODEN: SLGKF2
PB Sichuan Lianhe Daxue Xuebao, Gongcheng Kexueban Bianjibu
DT Journal
LA Chinese
AB The composite artificial bone of bone morphogenetic protein/**porous** .beta.-**tricalcium phosphate** (BMP/p-.beta.-TCP) with ability of osteoinduction and biodegrdn. has been studied. A new process prepg. .beta.-**tricalcium phosphate** (.beta.-TCP) bioceramic powders has been developed. The problem that very difficult filtering of gelatinous ppt. has been solved. The processing parameters in molding and sintering were investigated. The results show that Ca/P ratio of the prepd. p-.beta.-TCP bioceramic is 1.50, **porosity** vol. is 42.3%, diam. of macropores is 400 .mu.m, diam. of micropores is 5 .mu.m, compressive strength is 34.8 kg/cm2. The degrdn. expt. in vitro showed that it could be able to solve slightly in normal saline. The results of all tests of hemolysis, acute toxicity and pyrogen were found within normal range. The results of i.m. implantation test showed that BMP/p-.beta.-TCP has good osteoinduction. The BHP/p-.beta.-TCP materials were implanted into 1.5 cm radial defects of New Zealand rabbits, it has been showed that that bone repairing ability of BMP/p-.beta.-TCP is superior to the orthes (p-.beta.-TCP and P-HA) . The BMP/p-.beta.-TCP is suitable for substitution of autograft bone on repairing spongy bone defects.

L5 ANSWER 186 OF 806 CA COPYRIGHT 2003 ACS
AN 134:120849 CA
TI Materials engineering approaches towards advanced bioceramic coatings on Ti6Al4V **implants**
AU Heimann, Robert B.; Hemachandra, Khemchai; Itiravivong, Pibul
CS Dep. Mineralogy, Freiberg University of Mining and Technology, Germany
SO Journal of Metals, Materials and Minerals (1999), 8(2), 25-40
CODEN: JMMMCB; ISSN: 0857-6149
PB Chulalongkorn University, Metallurgy and Materials Science Research Institute
DT Journal
LA English
AB In this contribution several approaches towards engineering of bioceramic coatings applied by thermal spraying to titanium alloy substrates are being described. Optimization of plasma spray parameters can be used to deposit coatings with controlled **porosity**, high adhesive strength and optimum crystallinity. Microstructural engineering of the **hydroxyapatite** powder by pre-spray annealing leads to a substantial decrease of the microporosity of the ceramic grains. Moreover, bond coats based on titania and zirconia are being used to control the rate of heat transfer from the molten particles to the substrate and hence to improve the resorption resistance by suppressing the deposition of amorphous **calcium phosphate** (ACP).
RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 298 OF 806 CA COPYRIGHT 2003 ACS
AN 131:341920 CA
TI A preliminary study on osteoinduction of two kinds of **calcium phosphate** ceramics
AU Yuan, Huipin; Kurashina, Kenji; De Bruijn, Joost D.; Li, Yubao; De Groot, K.; Zhang, Xingdong
CS Institute of Materials Science and Technology, Sichuan Union University, Chengdu, 610064, Peop. Rep. China
SO Biomaterials (1999), 20(19), 1799-1806
CODEN: BIMADU; ISSN: 0142-9612
PB Elsevier Science Ltd.
DT Journal
LA English
AB With respect to the effect of material factors on **calcium phosphate** biomaterial-induced osteogenesis, the osteoinductive property of 2 kinds of **porous hydroxyapatite** ceramics, which were made by different producers, was investigated in dorsal muscles of dogs. One **hydroxyapatite** ceramic (S-HA), macroporous **implants** with rough pore walls contg. abundant micropores, was made by Sichuan Union University (China); the other **hydroxyapatite** ceramic (J-HA), **porous implants** with smooth macropore walls composed of regularly aligned crystal grains, was provided by Mitsubishi Ceramic Int. (Japan). Different tissue response was detected histol. and microradiog. after the ceramic samples had been implanted in dorsal muscles of dogs for 3 and 6 mo. Bone formation was found in S-HA at 3 mo, which increased at 6 mo. In contrast, no bone formation was detected in J-HA at both 3 and 6 mo. With the special architecture, **calcium phosphate** ceramic can induce bone formation in soft tissue. As both materials were very similar in their chem. and crystallog. structures, but varied in their microstructures, the latter seem to be an important factor affecting the osteoinductive capacity of **calcium phosphate** ceramics. Thus, by controlling the prepn. of **calcium phosphate** ceramic, bone substitutes with intrinsic osteoinductive property can be developed from **calcium phosphates**.

L5 ANSWER 292 OF 806 CA COPYRIGHT 2003 ACS
AN 132:83573 CA
TI The effect of heat treatment on the morphology of D-gun sprayed **hydroxyapatite** coatings
AU Erkmen, Ziya Engin
CS Materials Science Division, Lawrence Berkeley National Lab, Berkeley, CA, 94720, USA
SO Journal of Biomedical Materials Research (1999), 48(6), 861-868
CODEN: JBMRBG; ISSN: 0021-9304
PB John Wiley & Sons, Inc.
DT Journal
LA English
AB In this study, the morphol. of the **hydroxyapatite** (HA) coatings sprayed on Ti alloy samples by Detonation Gun Spray (D-Gun) and the effect of aging before and after heat treatment in physiol. soln. were obsd. Cross-sectional **porosity** and percentages of amorphous and crystal phase were measured using optical, electron microscopy, and X-ray diffraction anal. Differential Thermogravimetric Anal. (DTA) was performed to est. the glass-cryst. phase transformation temps. Heat-treatment at 300, 500, 700, 800 and 1200.degree. were carried out to confirm DTA results. As a final anal., the aging effect using Ringer's soln. for 1 wk on heat-treated and non-heat-treated samples was measured. It was obsd. that, in D-Gun-sprayed samples, the cross-sectional **porosity** stayed in the accepted 5% range as reported for other spraying techniques. On the other hand, surface **porosity** measured by using the water immersion method remained in the conventional **porosity** limit of 15% for non-heat-treated samples. Heat-treatment had a small influence on the **porosity** while the crystallinity increased considerably; in addn., aging had little effect on HA crystallinity for heat treated samples. Thus, D-gun-sprayed HA coatings had lower **porosity** and better integrity than other coatings, due to which we can expect better performance during in vivo applications.
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 291 OF 806 CA COPYRIGHT 2003 ACS
AN 132:83587 CA
TI Influence of surface microstructure on the reaction of the active ceramics in vivo
AU Yokozeki, H.; Hayashi, T.; Nakagawa, T.; Kurosawa, H.; Shibuya, K.; Ioku, K.
CS Department of Orthopaedic Surgery, Faculty of Medicine, The University of Tokyo, Tokyo, 113, Japan
SO Journal of Materials Science: Materials in Medicine (1998), 9(7), 381-384
CODEN: JSMMEL; ISSN: 0957-4530
PB Kluwer Academic Publishers
DT Journal
LA English
AB When **porosity** and macro-pore size differ in the same ceramic, the mode of bone regeneration and the degrdn. of ceramics in vivo is said to be different. However, the reactions in vivo of ceramics that have a different microstructure with the same **porosity** and the same macro-pore size, are not so far known. In this study, 2 kinds of .beta.-**tricalcium phosphate** (TCP) that had different microstructures but the same **porosity** and macro-pore size, were manufd. These TCP were implanted in the distal femurs of 20 mature male rabbits, and their resp. areas of ceramics and of regenerated bone were measured after 4, 12 and 24 wk. In both TCPs, the regenerated bone similarly decreased from 4-24 wk in a different way. The area of ceramics in one of these TCPs significantly decreased gradually throughout the observation period. On the other hand, the other TCP showed no marked decrease during the same period. This suggested a possibility that the difference in microstructure has a large effect on the reaction of the ceramics in the bone.
RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 287 OF 806 CA COPYRIGHT 2003 ACS
AN 132:112999 CA
TI Evaluation of human recombinant bone morphogenetic protein-2-loaded **tricalcium phosphate implants** in rabbits' bone defects
AU Laffargue, Ph.; Hildebrand, H. F.; Rtaimate, M.; Frayssinet, P.; Amoureux, J. P.; Marchandise, X.
CS Laboratoire de Biophysique, Unite Programmee de Recherche et d'Enseignement Scientifique, Equipe d'Accueil (UPRES EA) 1049, Faculte de Medecine, Lille, Fr.
SO Bone (New York) (1999), 25(2, Suppl.), 55S-58S
CODEN: BONEDL; ISSN: 8756-3282
PB Elsevier Science Inc.
DT Journal
LA English
AB **Porous** .beta.-**tricalcium phosphate** (.beta.TCP) has osteoconductive properties. The adsorption of human recombinant bone morphogenetic protein-2 (rhBMP-2) onto TCP could realize an osteoinductive bone substitute. We evaluated it on an animal model by dual-energy x-ray absorptiometry (DEXA) and solid-state 31P-NMR spectroscopy. .beta.TCP cylinders loaded with rhBMP-2 were implanted into rabbits' femoral condyle bone defects, and .beta.TCP alone as control into the contralateral femur. We studied 2 different doses of rhBMP-2 (10 and 40 .mu.g) on 2 groups of 4 animals. Evaluation consisted in radiog., histol., and histomorphometry, DEXA, and NMR spectroscopy using an original method of quantification. With both doses of rhBMP-2, we obsd. on radiographs an increase of trabecular bone around **implants**. Histol. showed resorption of the ceramic, trabecular bone with osteoblasts and osteoid substance around the **implants**, and colonization inside the **porous** .beta.TCP by new bone formed. Histomorphometry showed that the osteoid surface (OS/BS) was greatest with the high dose of rhBMP-2. The difference was slight between the low dose of rhBMP-2 and control. DEXA showed a dose-dependent increase of bone mineral d. of rhBMP-2-loaded .beta.TCP vs. control. NMR spectroscopy confirmed that the amt. of new bone formed in .beta.TCP was greater when .beta.TCP carried rhBMP-2, and increased with the dose of rhBMP-2 used. .beta.TCP was a good matrix for rhBMP-2, which gave it osteoinductive properties in an orthotopic site, in a dose-dependent manner. Thus, such composite biomaterial seems to be of great interest in reconstructive bone surgery. Further studies are needed in clin. practice to det. optimal doses.
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 283 OF 806 CA COPYRIGHT 2003 ACS
AN 132:156727 CA
TI Aqueous tape-casting of bioactive A/W-Al2O3 with low temperature sintering
AU Zeng, Yu-Ping; Jiang, Dong-Liang; Peter, Grail
CS State Key Lab of High Performance Cearmics and Superfine Structure, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, 200050, Peop. Rep. China
SO Wuji Cailiao Xuebao (1999), 14(4), 569-574
CODEN: WCXUET; ISSN: 1000-324X
PB Kexue Chubanshe
DT Journal
LA Chinese
AB For the synchronous sintering of Al2O3 and HAP, it is necessary to decrease the sintering temp. of Al2O3 to prevent decompn. of HAP. A/W bioglass which has low m.p. and bioactivity was selected as the liq. phase sintering additive, perfect A/W-Al2O3 slurries and A/W-Al2O3 tapes were fabricated and various factors which have great effect on the properties of slurries and the processing of tape casting were investigated. Because the bioglass evaps. easily at high temp., the densities of sample are greatly effected by sintering time and temp. But the relative d. of the samples prepd. at 1300.degree.C can be reached up to 99.17%, therefore, the A/W-Al2O3 and HAP tapes can be sintered together at low temp., it is possible to prep. the laminated bioactivity **implant** with **porous** bioactive HAP and A/W-Al2O3 substrate.

L5 ANSWER 281 OF 806 CA COPYRIGHT 2003 ACS
AN 132:156750 CA
TI A novel processing method for the fabrication of **porous** ceramic composites for application as bone replacements
AU Hignite, Michelle L.; Crimp, Melissa J.
CS Department of Materials Science and Mechanics, Michigan State University, East Lansing, MI, 48824-1226, USA
SO Advances in Science and Technology (Faenza, Italy) (1999), 28(Materials in Clinical Applications), 251-258
CODEN: ASETE5
PB Techna
DT Journal
LA English
AB Fiber reinforced **porous** ceramic composites have been fabricated using a modified **foaming** process that eliminates the use of binders. This method is repeatable, economical, fast and has been applied to alumina fiber reinforced alumina (Al2O3(f)/Al2O3), Al2O3 fiber reinforced **hydroxyapatite** (Al2O3(f)/HA) and preliminary investigations have begun using HA fiber reinforced HA composites (HA(f)/HA). Al2O3(f)/Al2O3 composites, having as little as 10-20% d. and interconnected **porosity** have been designed for use as molten metal filters. With fibrous reinforcement, these Al2O3(f)/Al2O3 reticulate ceramic composites have high compressive strengths up to 224 kPa as the **porosity** approaches 84%. The Al2O3(f)/HA and HA(f)/HA composites have been fabricated for use as bone substitutes where the fibers are included to provide added strength and toughness and the pore size is optimized to promote bone in-growth. Increases in fiber vol. percent from 2 to 3.1% have been shown to increase the compressive strength from 0.22 to 0.89 MPa in Al2O3(f)/HA composites. In the HA matrix composites, controlling the amts. of powder and hydrogen peroxide during green body processing resulted in av. pore sizes between 223 and 500 .mu.m which are in the range applicable for bony in-growth.
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 276 OF 806 CA COPYRIGHT 2003 ACS
AN 132:171015 CA
TI Macroporous synthetic **hydroxyapatite** bioceramics for bone substitute applications
AU Thomas, M. E.; Richter, P. W.; Van Deventer, T.; Crooks, J.; Ripamonti, U.
CS Manufacturing and Materials Division, CSIR, Pretoria, 0001, S. Afr.
SO South African Journal of Science (1999), 95(8), 359-362
CODEN: SAJSAR; ISSN: 0038-2353
PB Foundation for Research Development
DT Journal
LA English
AB An improved strategy is described for the manuf. of macroporous **hydroxyapatite** bioceramics for bone substitute applications. This is based on a modified fugitive phase technique, which allows prodn. of relatively open, high-strength devices. Properties of ceramics manufd. by this route are compared with those fashioned by 2 conventional methods. Aspects of design are discussed in terms of requirements for intrinsic osteoinductivity in vivo.
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 275 OF 806 CA COPYRIGHT 2003 ACS
AN 132:171028 CA
TI Ultrastructure investigation of **porous tricalcium phosphate** ceramics after implantation into rabbit femur
AU Chen, Qin; He, Jiping; Zheng, Qixin; Yu, Naiteng; Lin, Wenmei; Li, Shipu; Chen, Fang; Yan, Yuhua
CS Second Affiliated Hospital, Hubei Medical University, Wuhan, 430071, Peop. Rep. China
SO Zhongguo Shengwu Yixue Gongcheng Xuebao (1999), 18(3), 262-272
CODEN: ZSYXEI; ISSN: 0258-8021
PB Zhongguo Yixue Kexueyuan
DT Journal
LA Chinese
AB Ultrastructure of host bone tissue and biodegradable **porous tricalcium phosphate** (.beta.-TCP) ceramics **implants** were studied using polarizing microscopy and scan electron microscopy-EDXA 45 days after implantation into femoral condyle cavities of rabbits. The results showed the process of biodegrdn. and bone formation of the .beta.-TCP materials. The ultrastructure provided evidence for understanding biodegrdn. and bone-bonding mechanisms. Macrophages and osteoclast took part in degrdn. of .beta.-TCP ceramics by phagocytosis and extracellular resorption. Due to the presence of osteoblasts and osteocytes, the osteogenesis was completed. Moreover, a family of phosphorus-dependent and calcium-dependent enzymes were thought to play catalysis and active role in the biochem. reaction of bio-transformation of .beta.-TCP material, so the .beta.-TCP **porous** material could take part in new bone formation of host, thus showing its unique advantage.

L5 ANSWER 273 OF 806 CA COPYRIGHT 2003 ACS
AN 132:185392 CA
Correction of: 125:338968
TI The bonding behavior of DP-Bioglass and bone tissue
AU Lin, Feng-Huei; Yao, Chun-Hsu; Huang, Chin-Wang; Liu, Hwa-Chang; Sun, Jui-Sheng; Wang, Cheng-Yi
CS Coll. Medicine, National Taiwan Univ., Taipei, Taiwan
SO Materials Chemistry and Physics (1996), 46(1), 36-42
CODEN: MCHPDR; ISSN: 0254-0584
PB Elsevier
DT Journal
LA English
AB There are many reports of the surface reactions of surface-active ceramics. A Ca-P-rich layer was found on the surface of these bioactive ceramics implanted in bone tissue, a chem. bond having been established between the mineralized matrix of the bone and the **apatite** layer of the bioactive ceramic. It has been reported that the direct bonding of bone to DP-Bioglass was due to the deposition and subsequent mineralization of org. bone matrix at the outer layer of the **implant**. Thus the strength of the bonding of DP-Bioglass with bone structure is expected to be such that it will overcome the fixing problems of joint replacement and improved the long-term performance of prostheses of the bioactive glass is coated onto alloys or stainless steel. In this study, DP-Bioglass was pressed into a steel disk, 6 mm in diam. and 5 mm thick, under a hydrostatic pressure of 270 MPa, and then sintered at 810.degree.C for 2 h. The DP-Bioglass disks were implanted into the condyle are of mature male rabbits for 2, 4, 8, 16 and 32 wk. The failure load, when an **implant** detached from the bone or when the bone itself broke, was measured by a push-out test. Sintered **hydroxyapatite** bioceramic was used in a control group and the results were compared with those using DP-Bioglass. The histol. evaluation and histomorphometric investigation are described in the study to demonstrate the bonding behavior between DP-Bioglass and bone tissue.

ANSWER 267 OF 806 CA COPYRIGHT 2003 ACS

AN 132:241868 CA

TI Production of **porous hydroxyapatite** by the gel-casting of **foams** and cytotoxic evaluation

AU Sepulveda, P.; Binner, J. G. P.; Rogero, S. O.; Higa, O. Z.; Bressiani, J. C.

CS Departamento de Engenharia de Materiais, Universidade Federal de Sao Carlos, Sao Carlos, 13565-905, Brazil

SO Journal of Biomedical Materials Research (2000), 50(1), 27-34
CODEN: JBMRBG; ISSN: 0021-9304

PB John Wiley & Sons, Inc.

DT Journal

LA English

AB This study presents the manuf. of highly **porous hydroxyapatite** by a novel technique that employs the **foaming** of suspensions prior to the in situ polymn. of org. monomers contained in the compns. This method produces strong gelled bodies with up to 90% **porosity** that can withstand machining in the green state. Complex-shaped components can be obtained if the process comprises casting in one of the processing steps. The org. additives are eliminated at temps. above 300.degree.C, and sintering is carried out for consolidation of the ceramic matrix. Spherical interconnected cells with sizes ranging from 20 to 1000 .mu.m characterize the **porous** structure, depending on the specimen d. Cytotoxicity tests were conducted on exts. from sintered HA **foams** based on a quant. method of cell colony formation and the detn. of cell death after indirect contact of the **porous** material with mammalian cells. This in vitro test of biol. evaluation revealed that the original purity of the biomedical-grade **hydroxyapatite** powder was affected neither through processing nor by the employed reagents.

L5 ANSWER 265 OF 806 CA COPYRIGHT 2003 ACS
AN 132:313631 CA
TI Optimizing osteoinduction within **hydroxyapatite** biomaterials
AU Song, Liansheng; Gosain, Arun K.; Amarante, Marco T.; Nagy, Paul G.; Wilson, Charles R.; Toth, Jeffrey M.; Chow, Larry C.; Yamaguchi, Mark; Ricci, John L.
CS Division of Plastic Surgery, The Medical College of Wisconsin, Milwaukee, WI, USA
SO Surgical Forum (1998), 49, 663-665
CODEN: SUFOAX; ISSN: 0071-8041
PB American College of Surgeons
DT Journal
LA English
AB The present study investigated HA-derived biomaterials in an adult sheep model to det. whether these biomaterials demonstrate consistent osteoinduction when implanted in soft tissue sites removed from adjacent bone, and whether osteoinduction can be optimized by manipulating the compn. and **porosity** of the **implants**. Disks measuring 16.8 x 5 mm were prepd. from either ceramic (CER) or cement paste (CP) derivs. of HA and beta-**tricalcium phosphate** (TCP) as follows: (A) ceramic forms: (1) HA-CER (Interpore), (2) 60% HA/40% TCP-CER; (B) cement paste forms: (1) HA-CP, (2) 60% HA/40% TCP-CP, (3) 20% HA/80% TCP-CP. These biomaterials were implanted in both s.c. (SC) and i.m. (IM) soft tissue pockets in 10 adult sheep. Animals were killed 1 yr after implantation, and the biomaterials analyzed. The present study is the 1st true demonstration of osteoinduction within HA-derived biomaterials. The authors' study indicates that osteoinduction is maximized by maintaining a **porous** architecture, which is best achieved in CER forms of HA. Macropores can be introduced in CP forms of HA to render them osteoinductive if over half the **implant** consists of a rapidly resorbing component such as TCP. However, **porosity** and resultant bone formation are inconsistent and occur at the expense of significant vol. redn. of the original **implant**

L5 ANSWER 251 OF 806 CA COPYRIGHT 2003 ACS
AN 132:352673 CA
TI Enhancement of the in vivo osteogenic potential of marrow/ **hydroxyapatite** composites by recombinant human bone morphogenetic protein-2
AU Noshi, T.; Yoshikawa, T.; Ohgushi, H.; Dohi, Y.; Ikeuchi, M.; Horiuchi, K.; Sugimura, M.; Ichijima, K.
CS Departments of Oral and Maxillofacial Surgery, Nara Medical University, Nara, 634-8522, Japan
SO Bioceramics, Proceedings of the International Symposium on Ceramics in Medicine (1999), 12, 241-244
CODEN: BPCMFX
PB World Scientific Publishing Co. Pte. Ltd.
DT Journal
LA English
AB A composite of marrow mesenchymal stem cells and **porous** **hydroxyapatite** (HA) has in vivo osteogenic potential. To investigate factors enhancing the osteogenic potential of marrow/HA composites, we used recombinant human bone morphogenetic protein-2 (rhBMP-2). Marrow/HA composites or composites contg. marrow mesenchymal stem cells, rhBMP-2, and HA (marrow/BMP/HA composites) were implanted s.c. in 7-wk-old male Fischer rats. BMP/HA composites and HA alone were also implanted. The **implants** were harvested after 2 and 4 wk. Histol., obvious de novo bone formation together with active osteoblasts was seen at both 2 and 4 wk in many pores of the marrow/BMP/HA composites. The marrow/HA composites did not induce bone formation at 2 wk, but showed moderate bone formation at 4 wk. In contrast, neither the BMP/HA composites nor HA alone induced bone formation at any time after implantation. The combination of marrow mesenchymal stem cells, **porous** HA, and BMP synergistically enhances osteogenic potential and that the composites can be utilized effectively in osseous reconstructive surgery.
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

ANSWER 240 OF 806 CA COPYRIGHT 2003 ACS

AN 133:79281 CA

TI Preparation of a **porous tricalcium phosphate** bioceramic

AU Wu, Jianfeng; Xu, Xiaohong

CS Wuhan University of Technology, Peop. Rep. China

SO Taoci Xuebao (1999), 20(2), 104-107
CODEN: TAXUFH

PB Taoci Xuebao Zazhishe

DT Journal

LA Chinese

AB By reforming the constituents and prepn. of **porous tricalcium phosphate** (PTCP), the authors obtained a new bioceramic material with good biol. and mech. properties. The effect of the compn., microstructure of the PTCP material on its properties was analyzed by TC-DTA, XRD, SEM, etc. The effect on the biol. and phys. properties of this material was discussed.

L5 ANSWER 235 OF 806 CA COPYRIGHT 2003 ACS
AN 133:125235 CA
TI Osteoconduction at **porous hydroxyapatite** with various pore configurations
AU Chang, Bong-Soon; Lee, Choon-Ki; Hong, Kug-Sun; Youn, Hyuk-Joon; Ryu, Hyun-Seung; Chung, Sung-Soo; Park, Kun-Woo
CS Department of Orthopedic Surgery, Seoul National University College of Medicine, Clinical Research Institute, Seoul National University Hospital, Seoul, 110-744, S. Korea
SO Biomaterials (2000), 21(12), 1291-1298
CODEN: BIMADU; ISSN: 0142-9612
PB Elsevier Science Ltd.
DT Journal
LA English
AB To assess the histol. response and the reinforcing effects of bone ingrowth within **porous hydroxyapatite** (HA) **implants** depending on pore geometry, four kinds of cylindrical-type with parallel linear pores (.phi.50, 100, 300, 500 .mu.m), one kind of sponge-type with irregular interconnecting pores (.phi.250 .mu.m) and one cross-type with crossing linear pores (.phi.100 .times. 120 .mu.m) of **porous** HA were prepd. Eighty-four rabbits were divided into six groups, and a 5 .times. 5 .times. 7 mm sized **porous** HA block was inserted through the medial cortical window of the proximal tibia. Histomorphol. changes were examd. using light and SEM. A biomech. compression test was performed using material test machines. After implantation, the **implants** showed different histol. changes depending on pore geometry. Active osteoconduction was also found in the .phi.50 .mu.m sized cylindrical-type **porous** HA. Evidence of remodeling of new bone and bone marrow formation within **porous** HA was found in the larger cylindrical-types (.phi.300, 500 .mu.m), and the sponge- and cross-types. The biomech. test showed that the ultimate compressive strength increased significantly in the .phi.300 .mu.m sized cylindrical-type, and in the sponge- and cross-types eight weeks after implantation. **Porous** HA with cylindrical pores could be a useful graft material due to its strength, osteocond. and the ease with which its pore geometry can be controlled.
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 234 OF 806 CA COPYRIGHT 2003 ACS
AN 133:125240 CA
TI Morphometric and mechanical evaluation of titanium **implant** integration: comparison of five surface structures
AU Svehla, M.; Morberg, P.; Zicat, B.; Bruce, W.; Sonnabend, D.; Walsh, W. R.
CS Orthopaedic Research Laboratories, Department of Surgery, Prince of Wales Hospital, University of New South Wales, Sydney, 2031, Australia
SO Journal of Biomedical Materials Research (2000), 51(1), 15-22
CODEN: JBMRBG; ISSN: 0021-9304
PB John Wiley & Sons, Inc.
DT Journal
LA English
AB Achieving a stable bone-**implant** interface is an important factor in the long-term outcome of joint arthroplasty. In this study, we employed an ovine bicortical model to compare the bone-healing response to 5 different surfaces on titanium alloy **implants**: grit blasted (GB), grit blasted plus **hydroxyapatite** (50 .mu.m thick) coating (GBHA), Porocoat (PC), Porocoat with HA (PCHA) and smooth (S). Push-out testing, and backscatter SEM imaging were employed to assess the healing response at 4, 8, and 12 wk. Push-out testing revealed PC and PCHA surfaces resulted in significantly greater mech. fixation over all other **implant** types at all time points. HA coating on the grit-blasted surface significantly improved fixation at 8 and 12 wk. The addn. of HA onto the **porous** coating did not significantly improve fixation in this model. Quatification of in growth/on growth from SEM images revealed that HA coating of the grit-blasted surfaces resulted in significantly more on growth at 4 wk.
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 223 OF 806 CA COPYRIGHT 2003 ACS
AN 133:198752 CA
TI Method of coating prosthetic **implant** with a **calcium phosphate** compound
IN Gao, Yufei; Campbell, Allison A.
PA Battelle Memorial Institute, USA
SO U.S., 7 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6113993	A	20000905	US 1998-182741	19981028
PRAI	US 1998-182741		19981028		

AB The present invention is a method of coating a substrate with a **calcium phosphate** compd. using plasma enhanced MOCVD. The substrate is a solid material that may be **porous** or non-**porous**, including but not limited to metal, ceramic, glass and combinations thereof. The coated substrate is preferably used as an **implant**, including but not limited to orthopedic, dental and combinations thereof. **Calcium phosphate** compd. includes but is not limited to **tricalcium phosphate** (TCP), **hydroxyapatite** (HA) and combinations thereof. TCP is preferred on a titanium **implant** when **implant** resorbability is desired. HA is preferred when the bone bonding of new bone tissue into the structure of the **implant** is desired. Either or both of TCP and/or HA coated **implants** may be placed into a soln. with an agent selected from the group of protein, antibiotic, antimicrobial, growth factor and combinations thereof that can be adsorbed into the coating before implantation. Once implanted, the release of TCP will also release the agent to improve growth of new bone tissues and/or to prevent infection.

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 214 OF 806 CA COPYRIGHT 2003 ACS
AN 133:313421 CA
TI Biomimetic coatings on orthopedic **implants**: a review
AU De Groot, K.; Wen, H. B.; Liu, Yuelian; Layrolle, Pierre; Barrere, Florence
CS Iso Tis BV, Bilthoven, 3723 MB, Neth.
SO Materials Research Society Symposium Proceedings (2000), 599(Mineralization in Natural and Synthetic Biomaterials), 109-116
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal; General Review
LA English
AB A review, with 7 refs. In bone replacement surgery, replacement of joints (of hip, knee, finger and jaw) is a major sub discipline, requiring mech. strong and biol. compatible, or biocompatible, **implants**. Since mech. strength can only be achieved with metals that lack the required biocompatibility, surface treatments to improve that lack have been studied extensively. Since the mineral phase of bone consists of various calcium salts, the most relevant one being (carbonated) **apatite**, the surface treatments of choice are coatings of such salts on orthopedic **implants** have been successfully developed. (Bulk ceramics of CaP are too brittle to be used for load bearing **implants**). Although currently used coatings as obtained by plasma spraying have been highly successful, the high temp. and line-of-sight nature of the plasma spray process prevent (1) coatings to be deposited on **implants** made of polymer composites, (2) coatings to be deposited on complex surfaces and/or within **porous implants** and (3) biol. mols. such as growth factors or antibiotics to be included in the coating. Therefore, we and several other research groups have focussed our attention to so called biomimetic coatings, that are produced at ambient temp. by a pptn. process from fluids resembling body fluids in their inorg. compn. In this presentation, we will give a review of some current developments on biomimetic coatings.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 211 OF 806 CA COPYRIGHT 2003 ACS
AN 133:313551 CA
TI A novel method for solution deposition of **hydroxyapatite** on to three dimensionally **porous** metallic surfaces: peri-**apatite** HA
AU Zitelli, Joseph P.; Higham, Paul
CS Advanced Technology Group, Stryker Howmedica Osteonics, Rutherford, NJ, USA
SO Materials Research Society Symposium Proceedings (2000), 599(Mineralization in Natural and Synthetic Biomaterials), 117-128
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB A method for applying HA coatings to metallic surfaces, without the use of high temp. plasma spraying, has been developed. The HA coating is pptd. in an aq. soln. under conditions similar to those occurring in the body during bone formation. This surface mineralization process results in a coating which is highly cryst. and 100% HA. Processing and characterization experimentation and results are included in the paper. The coating method has the ability to penetrate macroporous (> 100 .mu. pores) metal structures and coat the undersides and interior surfaces of the areas designed for bone ingrowth on orthopedic devices used for joint replacements. This ability to coat all around a surface is the basis for the name Peri-**Apatite** HA. Electron microscopy is presented illustrating the coverage and morphol. of the coating. The Peri-**Apatite** HA coating is currently used on both knee joint replacement and hip joint replacement **implants**.
RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 381 OF 806 CA COPYRIGHT 2003 ACS
AN 129:153182 CA
TI Study of **porous** interconnections of bioceramic on cellular rehabitation in vitro and in vivo
AU Lu, J. X.; Flautre, B.; Anselme, K.; Gallur, A.; Descamps, M.; Thierry, B.; Hardouin, P.
CS IRMS Institut Calot, Berck-Sur-Afer, 62608, Fr.
SO Bioceramics, Proceedings of the International Symposium on Ceramics in Medicine (1997), 10, 583-586
CODEN: BPCMFX
PB Elsevier Science Ltd.
DT Journal
LA English
AB Our study would find the role of **porous** interconnections (PIC) on bone ingrowth and material degrdn. in **tricalcium phosphate** beta (.beta.-TCP) with about 50% **porosity**, a size of 100-300 .mu.m macropores and of 30-100 .mu.m PIC, In vitro. human osteoblasts were cultivated on disks with two delays: 14 and 28 days. In vivo. **implants** were implanted in middle diaphysis of both femurs with two delays: 12 and 24 wk. The in vitro and in vivo samples were obsd. with histomorphometry (HMM) and SEM. In vitro results show that human osteoblasts penetrate sizes of PIC over 20 .mu.m diam. (dia.), set up and grow inside the bioceramic macropores. In vivo HMM results show that PIC directly influence bone ingrowth inside pores and material degrdn. We notice that a PIC size over 50 .mu.m dia. allows formation of new bone ingrowth inside the pores. The PIC d. expresses the link between pores inside **porous** materials, assures the cells proliferation and tissular differentiation by extra cellular and vascular exchanges. In resorbable materials, pores and PIC initial densities play a more important role than their sizes.

ANSWER 374 OF 806 CA COPYRIGHT 2003 ACS

AN 129:221163 CA

TI Characterization of **hydroxyapatite** bio-coatings processed by electrocrystallization technique

AU Han, Yong; Xu, Kewei; Lu, Jian

CS State-Key Laboratory for Mechanical Behaviour of Materials, Xi'an Jiaotong University, Peop. Rep. China

SO Surface Modification Technologies XI, Proceedings of the International Conference on Surface Modification Technologies, 11th, Paris, Sept. 8-10, 1997 (1998), Meeting Date 1997, 379-387. Editor(s): Sudarshan, T. S.; Jeandin, M.; Khor, K. A. Publisher: Institute of Materials, London, UK. CODEN: 66MAA8

DT Conference

LA English

AB Highly pure brushite (CaHPO42H2O) coatings on **porous** Ti6Al4V substrate were prepd. by electrodeposition from aq. electrolytes. The influence of hydrothermal treatment temp. on brushite-to-**hydroxyapatite** conversion and the morphol. and phase compn. of **hydroxyapatite** (HAP) coatings are studied. The content, Ca/P atom ratio, grain size and pore size of HAP in coatings increases with increasing hydrothermal treatment temp. and that at the reasonable temp., highly pure HAP coatings with needle-like crystals and calcium-deficient form can be obtained, which are similar to that of **calcium phosphate** in human bone. By the means of sintering pure calcium-deficient **hydroxyapatite** coating on Ti6Al4V in air at 800.degree., the bonding strength of coating is improved, and at the same time the dense TiO2 film is formed on the substrate surface.

L5 ANSWER 327 OF 806 CA COPYRIGHT 2003 ACS
AN 131:23422 CA
TI **Porous hydroxyapatite**-dodecyl phosphate composite film on titania-titanium substrate
AU Soten, Ivana; Ozin, Geoffrey A.
CS Lash Miller Chemical Laboratories, Materials Chemistry Research Group, University of Toronto, Toronto, ON, M5S 3H6, Can.
SO Journal of Materials Chemistry (1999), 9(3), 703-710
CODEN: JMACEP; ISSN: 0959-9428
PB Royal Society of Chemistry
DT Journal
LA English
AB Synthetic analogs of bone are being actively pursued as materials for biomedical applications in the field of bone replacement, augmentation and repair. Numerous stringent criteria have to be met for a biomaterial to be considered as an acceptable bone **implant**, including the ability to integrate into bone and not cause any deleterious side effects. In this article we describe a materials chem. approach to synthesizing a new type of bone **implant** material. The strategy involves the spontaneous growth, under aq. physiol. pH conditions, of an oriented **hydroxyapatite** film with micron dimension **porosity**, on the surface of a layer of TiO2 that has been sputter deposited on Ti metal. This procedure creates desirable co-crystd. phases of **hydroxyapatite** (OHAp) and octacalcium phosphate (OCP) with preferred orientation resp. along the [001] and [101] directions. Subsequently, a calcium dodecyl phosphate mesolamellar phase has been grown within these oriented **porous** films to create a multilayered chem. composite CaDDP-OHAp-TiO2-Ti in which the CaDDP phase is stereochem. and charge matched with the OHAp.
RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

ANSWER 318 OF 806 CA COPYRIGHT 2003 ACS
AN 131:78391 CA
TI **Porosity** control of **hydroxyapatite implants**
AU Vaz, L.; Lopes, A. B.; Almeida, M.
CS Department of Ceramics and Glass Engineering, UIMC, University of Aveiro, Aveiro, 3810, Port.
SO Journal of Materials Science: Materials in Medicine (1999), 10(4), 239-242
CODEN: JSMMEL; ISSN: 0957-4530
PB Kluwer Academic Publishers
DT Journal
LA English
AB The characterization of **hydroxyapatite** (HAp) bodies was carried out by using a multiple slip-casting technique, in order to obtain dual-layer samples with differential sized **porosities**. The external layer, because of its **porosity**, controlled by the addn. of org. compds. (polyacrylate, PVC), will promote bone ingrowth. The internal denser layer, due to the addn. of lithium phosphate (Li3PO4) as sintering additive, will give mech. resistance to the **implant**. HAp aq. suspensions were characterized by rheol. measurements. SEM and intrusion mercury porosimetry were used to characterize sintered bodies. Thus, it is possible to introduce gross **porosity** in HAp bodies by the addn. of org. compds. A compatible shrinking of the layers during the sintering process and a good frequency of pores with an appropriate size in the external layer can be achieved with the use of org. additives.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 301 OF 806 CA COPYRIGHT 2003 ACS
AN 131:303349 CA
TI **Porous hydroxyapatite** ceramics and their ability to be fixed by commercially available screws
AU Ono, M. D. Ichiro; Tateshita, M. D. Tohru; Nakajima, Takehiko
CS Division of Plastic and Reconstructive Surgery, Department of Dermatology, School of Medicine, Fukushima Medical University, Fukushima, 960-1295, Japan
SO Biomaterials (1999), 20(17), 1595-1602
CODEN: BIMADU; ISSN: 0142-9612
PB Elsevier Science Ltd.
DT Journal
LA English
AB We developed **porous hydroxyapatite** ceramics (HAP) which are screw fixable and evaluated the fixing abilities of com. available screws using pull-out tests with the HAP **implants**. The fixing abilities were higher in the following order: Leibinger micro PLUS titanium screw > Osteomed M3 titanium screw > Leibinger std. mini screw > Martin-drill free screw. In preliminary examns., the fixing ability of each of the screws differed according to the hole diam. and depth of insertion but if inserted under optimum conditions, all were deemed to have adequate fixing ability for clin. applications. Therefore, screw systems are superior for fixing HAP **implants** to surrounding bone than the use of thread or wire. Specifically, Leibinger's micro PLUS titanium screws system seems to be a good option currently. The fact that effective fixation was achieved should result in a further increase in the clin. use of synthetic **porous** HAP **implants** whose **porosity** and pore size are completely controlled for those purposes.
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
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